HP ProCurve Switch 5400zl Series

Specifications

	HP ProCurve Switch 5406zl Intelligent Edge (J8697A)	HP ProCurve Switch 5412zl Intelligent Edge (J8698A)	HP ProCurve Switch 5406zl-48G Intelligent Edge (J8699A)
Included accessories			2 HP ProCurve Switch zl 24-Port 10/100/1000 PoE Module (J8702A) 1 HP ProCurve Switch zl 875W Power Supply (J8712A)
Ports	6 open module slots 1 RS-232C DB-9 console port Supports a maximum of 144 auto-sensing 10/100/1000 ports or 24 10-GbE ports or 144 mini-GBICs, or a combination	12 open module slots 1 RS-232C DB-9 console port Supports a maximum of 288 auto-sensing 10/100/1000 ports or 48 10-GbE ports or 288 mini-GBICs, or a combination	4 open module slots 48 auto-sensing 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T); Media Type: Auto-MDIX; Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only 1 RS-232C DB-9 console port Supports a maximum of 144 auto-sensing 10/100/1000 ports or 16 10-GbE ports or 96 mini-GBICs, or a combination
Power supplies	2 power-supply slots	4 power-supply slots	1 power-supply slots includes: 1 x J8712AHP ProCurve Switch zl 875 W Power Supply
Physical characteristics			
Dimensions	17.75(d) x 17.5(w) x 6.9(h) in. (45.09 x 44.45 x 17.53 cm) (4U height)	17.75(d) x 17.5(w) x 12.1(h) in. (45.09 x 44.45 x 30.73 cm) (7U height)	17.75(d) x 17.5(w) x 6.9(h) in. (45.09 x 44.45 x 17.53 cm) (4U height)
Weight	23.55 lb. (10.68 kg)	34.94 lb. (15.85 kg)	34.26 lb. (15.54 kg)
Memory and processor			
Gigabit Module	ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM	ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM	ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM
10G Module	ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM	ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM	ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM
Management Module	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 128 MB compact flash, 256 MB DDR SDRAM	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash Mb, 128 MB compact flash, 256 MB DDR SDRAM	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 128 MB compact flash, 256 MB DDR SDRAM
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance			
1000 Mb Latency	< 3.7 µs (FIFO 64-byte packets)	< 3.7 µs (FIFO 64-byte packets)	< 3.7 µs (FIFO 64-byte packets)
10 Gbps Latency	< 2.1 µs (FIFO 64-byte packets)	< 2.1 µs (FIFO 64-byte packets)	< 2.1 µs (FIFO 64-byte packets)
Throughput	up to 240.2 million pps	up to 480.3 million pps	up to 240.2 million pps
Routing/Switching capacity	322.8 Gbps	645.6 Gbps	322.8 Gbps
Switch fabric speed	345.6 Gbps	691.2 Gbps	345.6 Gbps
Routing table size	10,000 entries	10,000 entries	10,000 entries
Environment			
Operating temperature	32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8706A or J8707A modules installed	32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8706A or J8707A modules installed	32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8706A or J8707A modules installed
Operating relative humidity	15% to 95% @ 131°F (55°C), non-condensing	15% to 95% @ 131°F (55°C), non-condensing	15% to 95% @ 131°F (55°C), non-condensing
Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Non-operating/Storage relative humidity	15% to 95% @ 149°F (65°C), non-condensing	15% to 95% @ 149°F (65°C), non-condensing	15% to 95% @ 149°F (65°C), non-condensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	Power: 57 dB, Pressure: 40.2 dB ISO 7779, ISO 9296	Power: 64 dB, Pressure: 57.5 dB ISO 7779, ISO 9296	Power: 57 dB, Pressure: 40.2 dB ISO 7779, ISO 9296
Electrical characteristics			
	Achieved Miercom Certified Green Award		
Description	Chassis ships without power supplies. Two power supply slots available; three different power supplies available. See power supply products for additional specifications.	Chassis ships without power supplies. Four power supply slots available; three different power supplies available. See power supply products for additional specifications.	One J8712A installed. One open power supply slot available; three different power supplies available. See power supply products for additional specifications.
Maximum heat dissipation	2450 BTU/hr (2584 kJ/hr), (max. non-PoE); 3700 BTU/hr (3903 kJ/hr) (max. using PoE)	4900 BTU/hr (5169 kJ/hr), (max. non-PoE); 7400 BTU/hr (7,807 kJ/hr) (max. using PoE)	2450 BTU/hr (2584 kJ/hr), (max. non-PoE); 3700 BTU/hr (3903 kJ/hr) (max. using PoE)
Voltage	100-127 / 200-240 VAC	100-127 / 200-240 VAC	100-127 / 200-240 VAC
Idle power			166 W
Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz
Notes	Power supplies must be ordered separately. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.	Power supplies must be ordered separately. Two power supplies are required to power the J8698A chassis. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.	Idle power is the actual power consumption of the device with no ports connected. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.

HP ProCurve Switch 5400zl Series

Specifications (continued)

	HP ProCurve Switch 5406zl Intelligent Edge (J8697A)	HP ProCurve Switch 5412zl Intelligent Edge (J8698A)	HP ProCurve Switch 5406zl-48G Intelligent Edge (J8699A)
Safety	CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950	CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950	CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity			
EN	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2; 4 kV CD, 8 kV AD	IEC 61000-4-2; 4 kV CD, 8 kV AD	IEC 61000-4-2; 4 kV CD, 8 kV AD
Radiated	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m
EFT/Burst	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
Surge	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC
Conducted	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V
Power frequency magnetic field	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
Voltage dips and interruptions	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
Notes	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required.	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required.	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required.
Services	3-year, 4-hour onsite, 13x5 coverage for hardware (UE250E) 3-year, 4-hour onsite, 24x7 coverage for hardware (UE251E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (UE252E) 3-year, 24x7 SW phone support, software updates (UF786E) Installation with minimum configuration, system-based pricing (U4828E) Installation with HP-provided configuration, system-based pricing (U4832E) 4-year, 4-hour onsite, 13x5 coverage for hardware (UR900E) 4-year, 4-hour onsite, 24x7 coverage for hardware (UR901E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR902E) 4-year, 24x7 SW phone support, software updates (UR903E) 5-year, 4-hour onsite, 13x5 coverage for hardware (UR904E) 5-year, 4-hour onsite, 24x7 coverage for hardware (UR905E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR906E) 5-year, 24x7 SW phone support, software updates (UR907E) Refer to the HP Web site at www.procurve.com/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	3-year, 4-hour onsite, 13x5 coverage for hardware (UE253E) 3-year, 4-hour onsite, 24x7 coverage for hardware (UE254E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (UE255E) 3-year, 24x7 SW phone support, software updates (UF788E) Installation with minimum configuration, system-based pricing (U4828E) Installation with HP-provided configuration, system-based pricing (U4832E) 4-year, 4-hour onsite, 13x5 coverage for hardware (UR900E) 4-year, 4-hour onsite, 13x5 coverage for hardware (UR916E) 4-year, 4-hour onsite, 24x7 coverage for hardware (UR917E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR918E) 4-year, 24x7 SW phone support, software updates (UR919E) 5-year, 4-hour onsite, 13x5 coverage for hardware (UR920E) 5-year, 4-hour onsite, 24x7 coverage for hardware (UR921E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR922E) 5-year, 24x7 SW phone support, software updates (UR923E) Refer to the HP Web site at www.procurve.com/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	3-year, 4-hour onsite, 13x5 coverage for hardware (UE250E) 3-year, 4-hour onsite, 24x7 coverage for hardware (UE251E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (UE252E) 3-year, 24x7 SW phone support, software updates (UF786E) Installation with minimum configuration, system-based pricing (U4828E) Installation with HP-provided configuration, system-based pricing (U4832E) 4-year, 4-hour onsite, 24x7 coverage for hardware (UR901E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR902E) 4-year, 24x7 SW phone support, software updates (UR903E) 5-year, 4-hour onsite, 13x5 coverage for hardware (UR904E) 5-year, 4-hour onsite, 24x7 coverage for hardware (UR905E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR906E) 5-year, 24x7 SW phone support, software updates (UR907E) Refer to the HP Web site at www.procurve.com/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

HP ProCurve Switch 5400zl Series

Specifications (continued)

	HP ProCurve Switch 5406zl Intelligent Edge (J8697A)	HP ProCurve Switch 5412zl Intelligent Edge (J8698A)	HP ProCurve Switch 5406zl-48G Intelligent Edge (J8699A)
Standards and protocols (applies to all products in series)	**Device management** RFC 1591 DNS (client) HTML and telnet management **General protocols** IEEE 802.1ad Q-in-Q (Premium License) IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1v VLAN classification by Protocol and Port IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3af Power over Ethernet IEEE 802.3x Flow Control RFC 768 UDP RFC 783 TFTP Protocol (revision 2) RFC 792 ICMP RFC 793 TCP UDLD (Uni-directional Link Detection) RFC 826 ARP RFC 854 TELNET RFC 868 Time Protocol RFC 951 BOOTP RFC 1058 RIPv1 RFC 1350 TFTP Protocol (revision 2) RFC 1519 CIDR RFC 1542 BOOTP Extensions RFC 2030 Simple Network Time Protocol (SNTP) v4 RFC 2131 DHCP RFC 2453 RIPv2 RFC 2548 (MS-RAS-Vendor only) RFC 3046 DHCP Relay Agent Information Option RFC 3576 Ext to RADIUS (CoA only) RFC 3768 VRRP (Premium License) RFC 4675 RADIUS VLAN & Priority	**IP multicast** RFC 3376 IGMPv3 (host joins only) RFC 3973 Draft 2 PIM Dense Mode (Premium License) RFC 4601 Draft 10 PIM Sparse Mode (Premium License) **IPv6** RFC 1981 IPv6 Path MTU Discovery RFC 2460 IPv6 Specification RFC 2710 Multicast Listener Discovery (MLD) for IPv6 RFC 2925 Remote Operations MIB (Ping only) RFC 3019 MLDv1 MIB RFC 3315 DHCPv6 (client only) RFC 3513 IPv6 Addressing Architecture RFC 3596 DNS Extension for IPv6 RFC 3810 MLDv2 (host joins only) RFC 4022 MIB for TCP RFC 4113 MIB for UDP RFC 4251 SSHv6 Architecture RFC 4252 SSHv6 Authentication RFC 4253 SSHv6 Transport Layer RFC 4254 SSHv6 Connection RFC 4293 MIB for IP RFC 4419 Key Exchange for SSH RFC 4443 ICMPv6 RFC 4541 IGMP & MLD Snooping Switch RFC 4861 IPv6 Neighbor Discovery RFC 4862 IPv6 Stateless Address Auto-configuration **MIBs** RFC 1213 MIB II RFC 1493 Bridge MIB RFC 1724 RIPv2 MIB RFC 1850 OSPFv2 MIB RFC 2021 RMONv2 MIB RFC 2096 IP Forwarding Table MIB	RFC 2613 SMON MIB RFC 2618 RADIUS Client MIB RFC 2620 RADIUS Accounting MIB RFC 2665 Ethernet-Like-MIB RFC 2668 802.3 MAU MIB RFC 2674 802.1p and IEEE 802.1Q Bridge MIB RFC 2737 Entity MIB (Version 2) RFC 2787 VRRP MIB RFC 2863 The Interfaces Group MIB RFC 2925 Ping MIB **Network management** IEEE 802.1AB Link Layer Discovery Protocol (LLDP) RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events) RFC 3176 sFlow ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED) SNMPv1/v2c/v3 XRMON **OSPF** RFC 2328 OSPFv2 (Premium License) RFC 3101 OSPF NSSA **QoS/Cos** RFC 2474 DiffServ Precedence, including 8 queues/port RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF) **Security** IEEE 802.1X Port Based Network Access Control RFC 1492 TACACS+ RFC 2865 RADIUS (client only) RFC 2866 RADIUS Accounting Secure Sockets Layer (SSL) SSHv1/SSHv2 Secure Shell

HP ProCurve Switch 5400zl Series

Specifications

	HP ProCurve Switch 5412zl-96G Intelligent Edge (J8700A)	**HP ProCurve 5406zl-48G-PoE+ Switch (J9447A)**	**HP ProCurve 5412zl-96G-PoE+ Switch (J9448A)**
Included accessories	4 HP ProCurve Switch zl 24-Port 10/100/1000 PoE Module (J8702A) 2 HP ProCurve Switch zl 875W Power Supply (J8712A)	1 HP ProCurve 24-Port 10/100/1000 PoE+ zl Module (J9307A) 1 HP ProCurve 20-Port 10/100/1000 PoE+ and 4-Port Mini-GBIC zl Module (J9308A) 1 HP ProCurve 1500W PoE+ zl Power Supply (J9306A)	3 HP ProCurve 24-Port 10/100/1000 PoE+ zl Module (J9307A) 1 HP ProCurve 20-Port 10/100/1000 PoE+ and 4-Port Mini-GBIC zl Module (J9308A) 2 HP ProCurve 1500W PoE+ zl Power Supply (J9306A)
Ports	8 open module slots 96 auto-sensing 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T); Media Type: Auto-MDIX; Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only 1 RS-232C DB-9 console port Supports a maximum of 288 auto-sensing 10/100/1000 ports or 32 10-GbE ports or 192 mini-GBICs, or a combination	4 open module slots 44 RJ-45 auto-sensing 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T); Media Type: Auto-MDIX; Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only 4 open mini-GBIC (SFP) slots 1 RS-232C DB-9 console port Supports a maximum of 144 auto-sensing 10/100/1000 ports or 16 10-GbE ports or 96 mini-GBICs, or a combination	8 open module slots 92 RJ-45 auto-sensing 10/100/1000 ports (IEEE 802.3 Type 10Base-T, IEEE 802.3u Type 100Base-TX, IEEE 802.3ab Type 1000Base-T); Media Type: Auto-MDIX; Duplex: 10Base-T/100Base-TX: half or full; 1000Base-T: full only 4 open mini-GBIC (SFP) slots 1 RS-232C DB-9 console port Supports a maximum of 288 auto-sensing 10/100/1000 ports or 32 10-GbE ports or 192 mini-GBICs, or a combination
Power supplies	2 power-supply slots includes: 2 x J8712AHP ProCurve Switch zl 875 W Power Supply	1 power-supply slots includes: 1 x J9306AHP ProCurve 1500W PoE+ zl Power Supply	2 power-supply slots includes: 2 x J9306AHP ProCurve 1500W PoE+ zl Power Supply
Physical characteristics			
Dimensions	17.75(d) x 17.5(w) x 12.1(h) in. (45.09 x 44.45 x 30.73 cm) (7U height)	17.75(d) x 17.5(w) x 6.9(h) in. (45.09 x 44.45 x 17.53 cm) (4U height)	17.75(d) x 17.5(w) x 12.1(h) in. (45.09 x 44.45 x 30.73 cm) (7U height)
Weight	58 lb. (26.31 kg)	34.9 lb. (15.83 kg)	58.18 lb. (26.39 kg)
Memory and processor			
Gigabit Module	ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM	ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM	ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM
10G Module	ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM	ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM	ARM9 @ 200 MHz; packet buffer size: 144 Mb QDR SDRAM
Management Module	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash Mb, 128 MB compact flash, 256 MB DDR SDRAM	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 128 MB compact flash, 256 MB DDR SDRAM	Freescale PowerPC 8540 @ 666 MHz, 4 MB flash Mb, 128 MB compact flash, 256 MB DDR SDRAM
Mounting	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
Performance			
1000 Mb Latency	< 3.7 µs (FIFO 64-byte packets)	< 3.7 µs (FIFO 64-byte packets)	< 3.7 µs (FIFO 64-byte packets)
10 Gbps Latency	< 2.1 µs (FIFO 64-byte packets)	< 2.1 µs (FIFO 64-byte packets)	< 2.1 µs (FIFO 64-byte packets)
Throughput	up to 480.3 million pps	up to 240.2 million pps	up to 480.3 million pps
Routing/Switching capacity	645.6 Gbps	322.8 Gbps	645.6 Gbps
Switch fabric speed	691.2 Gbps	345.6 Gbps	691.2 Gbps
Routing table size	10,000 entries	10,000 entries	10,000 entries
Environment			
Operating temperature	32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8706A or J8707A modules installed	32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8706A or J8707A modules installed	32°F to 131°F (0°C to 55°C); 0°C to 40°C with J8706A or J8707A modules installed
Operating relative humidity	15% to 95% @ 131°F (55°C), non-condensing	15% to 95% @ 131°F (55°C), non-condensing	15% to 95% @ 131°F (55°C), non-condensing
Non-operating/Storage temperature	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)	-40°F to 158°F (-40°C to 70°C)
Non-operating/Storage relative humidity	15% to 95% @ 149°F (65°C), non-condensing	15% to 95% @ 149°F (65°C), non-condensing	15% to 95% @ 149°F (65°C), non-condensing
Altitude	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)	up to 10,000 ft. (3 km)
Acoustic	Power: 64 dB, Pressure: 57.5 dB ISO 7779, ISO 9296	Power: 57 dB, Pressure: 40.2 dB ISO 7779, ISO 9296	Power: 64 dB, Pressure: 57.5 dB ISO 7779, ISO 9296
Electrical characteristics			
Description	Two J8712A installed. Two open power supply slots available; three different power supplies available. See power supply products for additional specifications.	One J9306A installed. One open power supply slot available; three different power supplies available. See power supply products for additional specifications.	Two J9306A installed. Two open power supply slots available; three different power supplies available. See power supply products for additional specifications.
Maximum heat dissipation	4900 BTU/hr (5169 kJ/hr), (max. non-PoE); 7400 BTU/hr (7807 kJ/hr) (max. using PoE)	2450 BTU/hr (2584.75 kJ/hr), (max. non-PoE); 3700 BTU/hr (3903 kJ/hr) (max. using PoE)	4900 BTU/hr (5169.5 kJ/hr), (max. non-PoE); 7400 BTU/hr (7807 kJ/hr) (max. using PoE)
Voltage	100-127 / 200-240 VAC	110-127 / 200-240 VAC	110-127 / 200-240 VAC
Idle power	299 W	215 W	312 W
Frequency	50 / 60 Hz	50 / 60 Hz	50 / 60 Hz

HP ProCurve Switch 5400zl Series

Specifications (continued)

	HP ProCurve Switch 5412zl-96G Intelligent Edge (J8700A)	HP ProCurve 5406zl-48G-PoE+ Switch (J9447A)	HP ProCurve 5412zl-96G-PoE+ Switch (J9448A)
Notes	Idle power is the actual power consumption of the device with no ports connected. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.	Idle power is the actual power consumption of the device with no ports connected. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.	Idle power is the actual power consumption of the device with no ports connected. Heat dissipation does not include heat dissipated by the PoE powered devices themselves.
Safety	CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950	CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950	CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950
Emissions	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
Immunity			
EN	EN 55024, CISPR 24	EN 55024, CISPR 24	EN 55024, CISPR 24
ESD	IEC 61000-4-2; 4 kV CD, 8 kV AD	IEC 61000-4-2; 4 kV CD, 8 kV AD	IEC 61000-4-2; 4 kV CD, 8 kV AD
Radiated	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m	IEC 61000-4-3; 3 V/m
EFT/Burst	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
Surge	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC	IEC 61000-4-5; 1 kV/2 kV AC
Conducted	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V	IEC 61000-4-6; 3 V
Power frequency magnetic field	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
Voltage dips and interruptions	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
Harmonics	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2	EN 61000-3-2, IEC 61000-3-2
Flicker	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3	EN 61000-3-3, IEC 61000-3-3
Management	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)	HP ProCurve Manager Plus; HP ProCurve Manager (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
Notes	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required.	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required.	When using mini-GBICs with this product, mini-GBICs with revision "B" or later (product number ends with the letter "B" or later, e.g., J4858B, J4859C) are required.
Services	3-year, 4-hour onsite, 13x5 coverage for hardware (UE253E) 3-year, 4-hour onsite, 24x7 coverage for hardware (UE254E) 3-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone support (UE255E) 3-year, 24x7 SW phone support, software updates (UF788E) Installation with minimum configuration, system-based pricing (U4828E) Installation with HP-provided configuration, system-based pricing (U4832E) 4-year, 4-hour onsite, 13x5 coverage for hardware (UR916E) 4-year, 4-hour onsite, 24x7 coverage for hardware (UR917E) 4-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR918E) 4-year, 24x7 SW phone support, software updates (UR919E) 5-year, 4-hour onsite, 13x5 coverage for hardware (UR920E) 5-year, 4-hour onsite, 24x7 coverage for hardware (UR921E) 5-year, 4-hour onsite, 24x7 coverage for hardware, 24x7 software phone (UR922E) 5-year, 24x7 SW phone support, software updates (UR923E) Refer to the HP Web site at www.procurve.com/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	Refer to the HP Web site at www.procurve.com/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.	Refer to the HP Web site at www.procurve.com/services for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local HP sales office.

HP ProCurve Switch 5400zl Series

Specifications (continued)

	HP ProCurve Switch 5412zl-96G Intelligent Edge (J8700A)	HP ProCurve 5406zl-48G-PoE+ Switch (J9447A)	HP ProCurve 5412zl-96G-PoE+ Switch (J9448A)
Standards and protocols (applies to all products in series)	**Device management** RFC 1591 DNS (client) HTML and telnet management **General protocols** IEEE 802.1ad Q-in-Q (Premium License) IEEE 802.1D MAC Bridges IEEE 802.1p Priority IEEE 802.1Q VLANs IEEE 802.1s Multiple Spanning Trees IEEE 802.1v VLAN classification by Protocol and Port IEEE 802.1w Rapid Reconfiguration of Spanning Tree IEEE 802.3ad Link Aggregation Control Protocol (LACP) IEEE 802.3af Power over Ethernet IEEE 802.3x Flow Control RFC 768 UDP RFC 783 TFTP Protocol (revision 2) RFC 792 ICMP RFC 793 TCP UDLD (Uni-directional Link Detection) RFC 826 ARP RFC 854 TELNET RFC 868 Time Protocol RFC 951 BOOTP RFC 1058 RIPv1 RFC 1350 TFTP Protocol (revision 2) RFC 1519 CIDR RFC 1542 BOOTP Extensions RFC 2030 Simple Network Time Protocol (SNTP) v4 RFC 2131 DHCP RFC 2453 RIPv2 RFC 2548 (MS-RAS-Vendor only) RFC 3046 DHCP Relay Agent Information Option RFC 3576 Ext to RADIUS (CoA only) RFC 3768 VRRP (Premium License) RFC 4675 RADIUS VLAN & Priority	**IP multicast** RFC 3376 IGMPv3 (host joins only) RFC 3973 Draft 2 PIM Dense Mode (Premium License) RFC 4601 Draft 10 PIM Sparse Mode (Premium License) **IPv6** RFC 1981 IPv6 Path MTU Discovery RFC 2460 IPv6 Specification RFC 2710 Multicast Listener Discovery (MLD) for IPv6 RFC 2925 Remote Operations MIB (Ping only) RFC 3019 MLDv1 MIB RFC 3315 DHCPv6 (client only) RFC 3513 IPv6 Addressing Architecture RFC 3596 DNS Extension for IPv6 RFC 3810 MLDv2 (host joins only) RFC 4022 MIB for TCP RFC 4113 MIB for UDP RFC 4251 SSHv6 Architecture RFC 4252 SSHv6 Authentication RFC 4253 SSHv6 Transport Layer RFC 4254 SSHv6 Connection RFC 4293 MIB for IP RFC 4419 Key Exchange for SSH RFC 4443 ICMPv6 RFC 4541 IGMP & MLD Snooping Switch RFC 4861 IPv6 Neighbor Discovery RFC 4862 IPv6 Stateless Address Auto-configuration **MIBs** RFC 1213 MIB II RFC 1493 Bridge MIB RFC 1724 RIPv2 MIB RFC 1850 OSPFv2 MIB RFC 2021 RMONv2 MIB RFC 2096 IP Forwarding Table MIB	RFC 2613 SMON MIB RFC 2618 RADIUS Client MIB RFC 2620 RADIUS Accounting MIB RFC 2665 Ethernet-Like-MIB RFC 2668 802.3 MAU MIB RFC 2674 802.1p and IEEE 802.1Q Bridge MIB RFC 2737 Entity MIB (Version 2) RFC 2787 VRRP MIB RFC 2863 The Interfaces Group MIB RFC 2925 Ping MIB **Network management** IEEE 802.1AB Link Layer Discovery Protocol (LLDP) RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events) RFC 3176 sFlow ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED) SNMPv1/v2c/v3 XRMON **OSPF** RFC 2328 OSPFv2 (Premium License) RFC 3101 OSPF NSSA **QoS/Cos** RFC 2474 DiffServ Precedence, including 8 queues/port RFC 2597 DiffServ Assured Forwarding (AF) RFC 2598 DiffServ Expedited Forwarding (EF) **Security** IEEE 802.1X Port Based Network Access Control RFC 1492 TACACS+ RFC 2865 RADIUS (client only) RFC 2866 RADIUS Accounting Secure Sockets Layer (SSL) SSHv1/SSHv2 Secure Shell

HP ProCurve Switch 5400zl Series accessories

HP ProCurve ONE Services zl Module (J9289A)
NEW HP ProCurve Threat Management Services zl Module (J9155A)
NEW HP ProCurve Threat Management Services zl Module with 1-year IDS/IPS subscription (J9156A)
Premium License for Switch 5400 Series (J8994A)
NEW HP ProCurve MSM760/765 40-access point license (J9371A)
HP ProCurve Switch zl 875 W Power Supply (J8712A)
HP ProCurve Switch zl 1500 W Power Supply (J8713A)
HP ProCurve Switch zl Power Supply Shelf (J8714A)
NEW HP ProCurve 1500W PoE+ zl Power Supply (J9306A)
HP ProCurve 10-GbE X2-SC SR Optic (J8436A)
HP ProCurve 10-GbE X2-SC LR Optic (J8437A)
HP ProCurve 10-GbE X2-SC ER Optic (J8438A)
HP ProCurve 10-GbE CX4 Media Converter (J8439A)
HP ProCurve 10-GbE X2-CX4 Transceiver (J8440B)
HP ProCurve 10-GbE X2-SC LRM Optic (J9144A)
HP ProCurve 10-GbE SFP+ SR Transceiver (J9150A)
HP ProCurve 10-GbE SFP+ LR Transceiver (J9151A)
HP ProCurve 10-GbE SFP+ LRM Transceiver (J9152A)
NEW HP ProCurve 10-GbE SFP+ 1m Direct Attach Cable (J9281B)
NEW HP ProCurve 10-GbE SFP+ 3m Direct Attach Cable (J9283B)
NEW HP ProCurve 10-GbE SFP+ 7m Direct Attach Cable (J9285B)
HP ProCurve Gigabit-SX-LC Mini-GBIC (J4858C)
HP ProCurve Gigabit-LX-LC Mini-GBIC (J4859C)
HP ProCurve Gigabit-LH-LC Mini-GBIC (J4860C)
HP ProCurve Gigabit 1000Base-T Mini-GBIC (J8177C)
HP ProCurve 1000-BX-D SFP-LC Mini-GBIC (J9142B)
HP ProCurve 1000-BX-U SFP-LC Mini-GBIC (J9143B)
HP ProCurve 100-FX SFP-LC Transceiver (J9054B)
HP ProCurve 100-BX-D SFP-LC Transceiver (J9099B)
HP ProCurve 100-BX-U SFP-LC Transceiver (J9100B)
HP ProCurve Manager 3.0 (--)

Wireless Access Controllers

HP ProCurve Wireless Edge Services zl Module (J9051A)
HP ProCurve Redundant Wireless Services zl Module (J9052A)
NEW HP ProCurve MSM765zl Mobility Controller (J9370A)

zl Modules

HP ProCurve Switch zl 24-Port 10/100/1000 PoE Module (J8702A)
HP ProCurve Switch zl 20-Port 10/100/1000 + 4-Port Mini-GBIC Module (J8705A)
HP ProCurve Switch zl 24-Port Mini-GBIC Module (J8706A)
HP ProCurve Switch zl 4-Port 10-GbE X2 Module (J8707A)
HP ProCurve Switch zl 4-Port 10-GbE CX4 Module (J8708A)
NEW HP ProCurve 24-Port 10/100/1000 PoE+ zl Module (J9307A)
NEW HP ProCurve 20-Port 10/100/1000 PoE+ and 4-Port Mini-GBIC zl Module (J9308A)
NEW HP ProCurve 4-Port 10GbE SFP+ zl Module (J9309A)
NEW HP ProCurve 24-Port 10/100 PoE+ zl Module (J9478A)

Products within this series have achieved sufficient scores in each of the rated criteria to achieve the Miercom Certified Green distinction Award. See the Specifications section of this series for more information.

Technology for better business outcomes

To learn more, visit www.hp.com/go/procurve

© Copyright 2009 Hewlett-Packard Development Company, L.P. The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein. Intel, Core, Pentium, and Xeon are trademarks of Intel Corporation in the U.S. and other countries. Microsoft, Windows, Windows NT, and Windows Vista are U.S. registered trademarks of Microsoft Corporation.

4AA2-6511ENW, Rev 1, July 2009

ProCurve Networking